What is claimed is:

1. A modulation device for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent ones of the code words with a merge bit sequence of **r** bits to form a code word sequence, and outputting the code word sequence, wherein

when the code word sequence is generated, the DSV of the code word sequence is controlled by inserting the merge bit sequence of r bits between the adjacent code words without conforming to at least one of a minimum run-length (d+1)T and a maximum run-length (k+1)T which are set on the basis of a run-length limiting rule RLL(d, k).

2. The modulation device as claimed in claim 1 wherein the DSV of the code word sequence is controlled by inserting the merge bit sequence of **r** bits between the adjacent code words without conforming to the maximum run-length (k+1)T on the basis of the run-length limiting rule RLL(d, k) but permitting a maximum run-length of (k+2)T.

3. The modulation device as claimed in claim 1 wherein the code word sequence is output not to conform to the run-length limiting rule RLL(d, k) for a predetermined period during which is input specific data as the input data word with which particular frequency components would appear in a code word sequence if outputting to conform to the run-length limiting rule RLL(d, k).

4. The modulation device as claimed in claim 3 wherein the specific data comprises alternating current signals or direct current signals which are not distinctively audible.

5. The modulation device as claimed in claim 3 wherein

when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

6. The modulation device as claimed in claim 3 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

7. A recording medium on which is recorded the code word sequence encoded by the modulation device as recited in claim 1.

8. A modulation method for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent ones of the code words with a merge bit sequence of **r** bits to form a code word sequence, and outputting the code word sequence, wherein

when the code word sequence is generated, the DSV of the code word sequence is controlled by inserting the merge bit sequence of **r** bits between the adjacent code words without conforming to at least one of a minimum run-length (d+1)T and a maximum run-length (k+1)T which are set on the basis of a run-length limiting rule RLL(d, k).

9. The modulation method as claimed in claim 8 wherein the DSV of the code word sequence is controlled by inserting the merge bit sequence of **r** bits between the adjacent code words without conforming to the maximum run-length (k+1)T on the basis of the run-length limiting rule RLL(d, k) but

permitting a maximum run-length of (k+2)T.

10. The modulation method as claimed in claim 8 wherein the code word sequence is output not to conform to the run-length limiting rule RLL(d, k) for a predetermined period during which is input specific data as the input data word with which particular frequency components would appear in a code word sequence if outputting to conform to the run-length limiting rule RLL(d, k).

11. The modulation method as claimed in claim 10 wherein the specific data comprises alternating current signals or direct current signals which are not distinctively audible.

12. The modulation method as claimed in claim 10 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

13. The modulation method as claimed in claim 10 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

14. A recording medium on which is recorded the code word sequence encoded in accordance with the modulation method as recited in claim 8.

15. A modulation device for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent

ones of the code words with a merge bit sequence of r bits to form a code word sequence, and outputting the code word sequence, the modulation device comprising:

a modulation means for converting the input data words of p bits into the code words of q bits while prefetching at least a current code word, a next code word, and a further next code word;

a merge bit inserting means for generating a plurality of code word sequences by temporarily concatenating the current code word and the next code word with each of a plurality of merge bit sequences of the r bits respectively to prepare a plurality of code word sequences without conforming to the run-length limiting rule, and then temporarily concatenating at least the further next code word and the next code word of each code word sequence with each of the plurality of merge bit sequences of the r bits to prepare a large number of code word sequences from the current code word to the further next code word without conforming to the run-length limiting rule;

a DSV value calculation means for calculating the DSV value of each of the large number of code word sequences as generated by the merge bit inserting means;

a comparing and selecting means for selecting one code word sequence having an absolute DSV value as calculated by the DSV value calculation means closest to zero among the large number of code word sequences; and

a final code word sequence output means for outputting a final code word sequence finally determined by concatenating the current code word and the next code word with the merge bit sequence which is inserted between the current code word and the next code word of the one code word sequence as selected by the comparing and selecting means.

16. The modulation device as claimed in claim 15 wherein the merge bit sequence of r bits is inserted between the adjacent

code words without conforming to the maximum run-length (k+1)T on the basis of the run-length limiting rule RLL(d, k) but permitting a maximum run-length of (k+2)T.

17. The modulation device as claimed in claim 15 wherein the code word sequence is output not to conform to the run-length limiting rule RLL(d, k) for a predetermined period during which is input specific data as the input data word with which particular frequency components would appear in a code word sequence if outputting to conform to the run-length limiting rule RLL(d, k).

18. The modulation device as claimed in claim 17 wherein the specific data comprises alternating current signals or direct current signals which are not distinctively audible.

19. The modulation device as claimed in claim 17 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

20. The modulation device as claimed in claim 17 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

21. A recording medium on which is recorded the code word sequence encoded by the modulation device as recited in claim 15.

22. A modulation method for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent ones of the code words with a merge bit sequence of **r** bits to form a code word sequence, and outputting the code word sequence, the modulation method comprising:

a first step of converting the input data words of **p** bits into the code words of **q** bits while prefetching at least a current code word, a next code word, and a further next code word;

a second step of generating a plurality of code word sequences by temporarily concatenating the current code word and the next code word with each of a plurality of merge bit sequences of the **r** bits respectively to prepare a plurality of code word sequences without conforming to the run-length limiting rule RLL(d, k), and then temporarily concatenating at least the further next code word and the next code word of each code word sequence with each of the plurality of merge bit sequence of the **r** bits to prepare a large number of code word sequences from the current code word to the further next code word without conforming to the run-length limiting rule RLL(d, k);

a third step of calculating the DSV value of each of the large number of code word sequences as generated in the second step;

a fourth step of selecting one code word sequence having an absolute DSV value as calculated in the third step closest to zero among the large number of code word sequences; and

a fifth step of outputting a final code word sequence finally determined by concatenating the current code word and the next code word with the merge bit sequence which is inserted between the current code word and the next code word of the one code word sequence as selected in the fourth step.

23. The modulation method as claimed in claim 22 wherein

the merge bit sequence of r bits is inserted between the adjacent code words without conforming to the maximum run-length (k+1)T on the basis of the run-length limiting rule RLL(d, k) but permitting a maximum run-length of (k+2)T.

24. The modulation method as claimed in claim 22 wherein the code word sequence is output not to conform to the run-length limiting rules RLL(d, k) for a predetermined period during which is input specific data as the input data word with which particular frequency components would appear in a code word sequence if outputting to conform to the run-length limiting rules RLL(d, k).

25. The modulation method as claimed in claim 24 wherein the specific data comprises alternating current signals or direct current signals which are not distinctively audible.

26. The modulation method as claimed in claim 24 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

27. The modulation method as claimed in claim 24 wherein when the specific data which is not distinctively audible is input for a predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

28. A recording medium on which is recorded the code word sequence encoded by the modulation method as recited in claim 22.

29. A modulation device for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent ones of the code words with a merge bit sequence of **r** bits to form a code word sequence, and outputting the code word sequence, the modulation device comprising:

a modulation means for converting the input data words of **p** bits into the code words of **q** bits while prefetching at least a current code word, a next code word, and a further next code word;

a merge bit inserting means for generating a plurality of code word sequences by temporarily concatenating the current code word and the next code word with each of a plurality of merge bit sequences of the **r** bits respectively to prepare a plurality of code word sequences with the run-length limiting rule conformed, and then temporarily concatenating at least the further next code word and the next code word of each code word sequence with each of the plurality of merge bit sequences of the **r** bits to prepare a large number of code word sequences from the current code word to the further next code word with the run-length limiting rule conformed;

a DSV value calculation means for calculating the DSV value of each of the large number of code word sequences as generated by the merge bit inserting means;

a comparing and selecting means for selecting one code word sequence having an absolute DSV value as calculated by the DSV value calculation means closest to zero among the large number of code word sequences; and

a final code word sequence output means for outputting a final code word sequence finally determined by concatenating the current code word and the next code word with the merge bit sequence which is inserted between the current code word and the next code word of the one code word sequence as selected by the comparing and selecting means, wherein

specific data is input for a predetermined period as the input data and the input data word is encoded by the p-q modulation scheme, the specific data comprising alternating current signals or direct current signals which would cause a modulation device that prefetches only the next code word to output a code word sequence which includes particular frequency components.

30. The modulation device as claimed in claim 29 wherein when the specific data which is not distinctively audible is input for the predetermined period while the input data words comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

31. The modulation device as claimed in claim 29 wherein when the specific data which is not distinctively audible is input for the predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

32. A recording medium on which is recorded the code word sequence encoded by the modulation device as recited in claim 29.

33. A modulation method for converting input data words of **p** bits into code words of **q** bits, concatenating adjacent ones of the code words with a merge bit sequence of **r** bits to form a code word sequence, and outputting the code word sequence, the modulation method comprising:

a first step of converting the input data words of **p** bits into the code words of **q** bits while prefetching at least a current code word, a next code word, and a further next code

word;

a second step of generating a plurality of code word sequences by temporarily concatenating the current code word and the next code word with each of a plurality of merge bit sequences of the r bits respectively to prepare a plurality of code word sequences with the run-length limiting rule conformed, and then temporarily concatenating at least the further next code word and the next code word of each code word sequence with each of the plurality of merge bit sequences of the r bits to prepare a large number of code word sequences from the current code word to the further next code word with the run-length limiting rule RLL conformed;

a third step of calculating the DSV value of each of the large number of code word sequences as generated in the second step;

a fourth step of selecting one code word sequence having an absolute DSV value as calculated in the third step closest to zero among the large number of code word sequences; and

a fifth step of outputting a final code word sequence finally determined by concatenating the current code word and the next code word with the merge bit sequence which is inserted between the current code word and the next code word of the one code word sequence as selected in the fourth step, wherein

specific data is input for a predetermined period as the input data and the input data word is encoded by the p-q modulation scheme, the specific data comprising alternating current signals or direct current signals which would cause a modulation device that prefetches only the next code word to output a code word sequence which includes particular frequency components.

34. The modulation method as claimed in claim 33 wherein when the specific data which is not distinctively audible is input for the predetermined period while the input data words

comprise music information, the specific data is inserted to the gap of silence between adjacent performances of music.

35. The modulation method as claimed in claim 33 wherein when the specific data which is not distinctively audible is input for the predetermined period while the input data words comprise music information, the specific data is inserted to an area located within the gap of silence between adjacent performances of music but located outside of the area given the index number 00.

36. A recording medium on which is recorded the code word sequence encoded by the modulation method as recited in claim 33.